DASH: Adaptive Video Streaming

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Project Setup

Project Statement

Create a streaming media testbed using open source software.

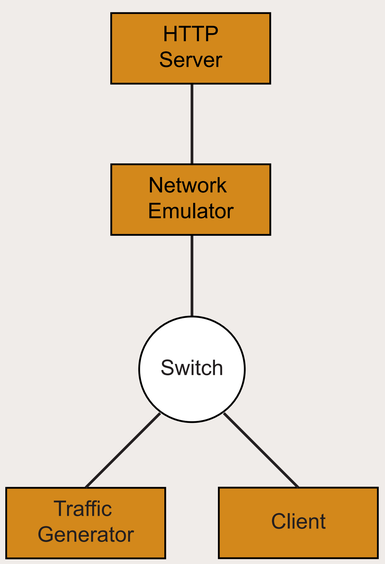
Study the performance characteristics & possible interactions between the adaptive mechanism & the standard protocol stacks, as described in the recent paper "Dynamic Adaptive Streaming over HTTP Dataset."

Background Research

"Dynamic Adaptive Streaming over HTTP Dataset"
- Lederer, Müller, & Timmerer from Alpen-Adria Universität.

This team's research is entirely open source & their documentation includes how they set up their video files, setup of their system, testing, & data analysis.

Testbed Setup



HTTP Server
Stores:
- Video Files
- Video Manifests

Network Emulator
Simulates different:
- Bandwidths
- Time Delays
- Percentage Packet Loss

Traffic Generator
Generates traffic across the network.

Client
Watches the MPEG-DASH video.

Testbed Tools

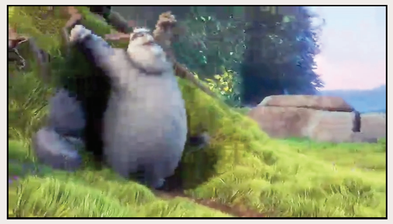
- Server - Apache
- Traffic Generator - Traffic Shaper
- Packet Capture - Wireshark
- Network Emulator - WanEm
- Client - VLC
- Operating System - Linux

Adaptive Streaming

What is Dynamic Adaptive Streaming?

Adjusts video quality based on the User's current bandwidth speed in real time.

Low Bandwidth

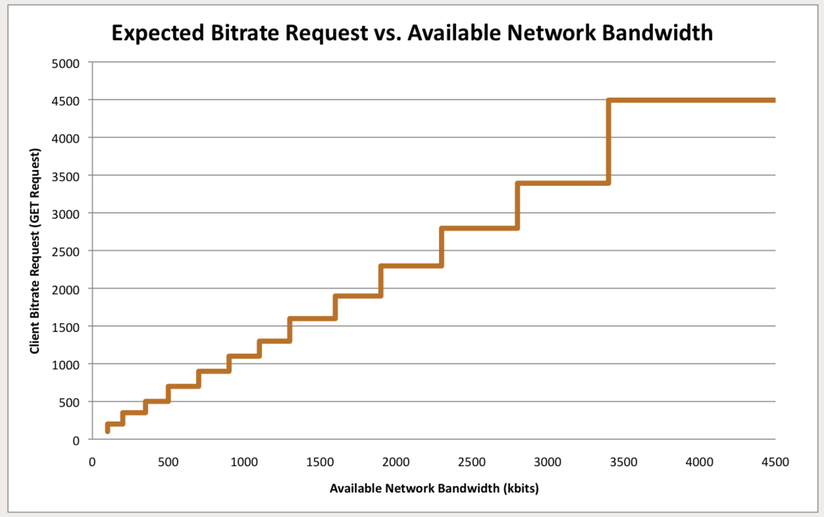


Low Quality

High Bandwidth

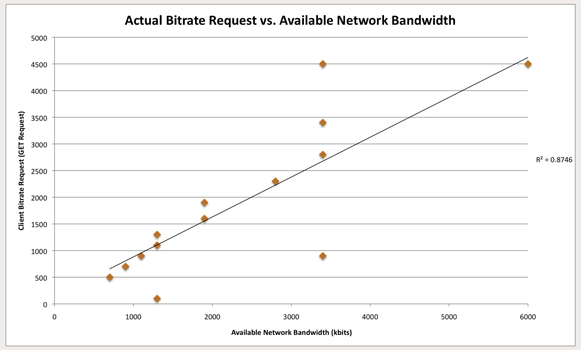
High Quality

Expected Performance

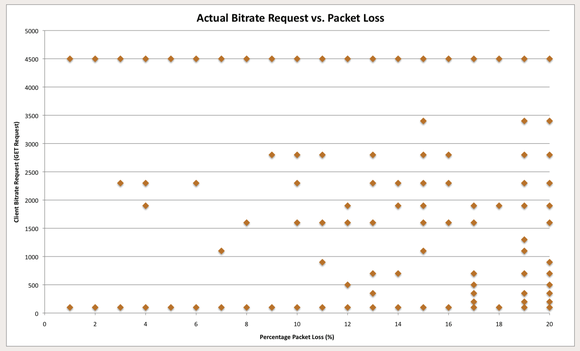


Statistical Analysis

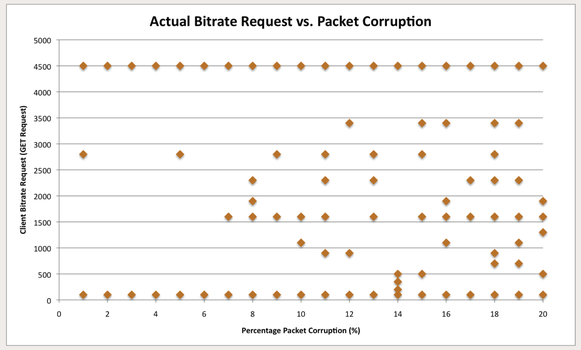
Actual Performance



TCP Packet Loss



TCP Packet Corruption



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